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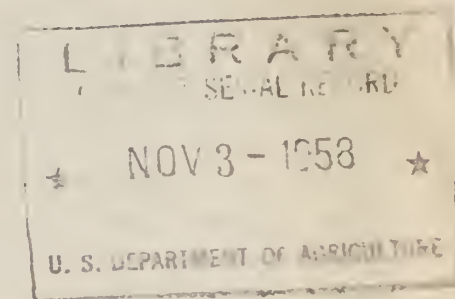
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Developments for the Improvement of Livestock ^{1/}
Through Management

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The production of livestock and livestock products has kept full pace with population increases in recent years. This has been more as a sustained increase in production per livestock breeding unit than as an increase in total numbers. Management has taken advantage of numerous factors in accomplishing this goal. The applications of research findings ranging all the way from soil, water, fertilizer use, and improved cropping practices to breeding, nutrition, and physiology improvements in producing livestock and to greater efficiency in livestock farming through machinery, size of individual farm operation, and numerous specific management changes have all helped. Projections for the feeding of future population increases within a reasonable time appear fully possible of attainment. This is so because further increases especially in efficiency of production appear to be entirely reasonable.

In numbers of livestock, cattle inventories have exceeded 96 million head in two recent years as compared to about 77 million head 10 years ago. Hog numbers have fluctuated considerably. They have been down somewhat at least for the past two years. Sheep numbers have held fairly steady for the last 10 years. Horses and mules continue to decline, the current numbers being approximately 3.5 million head or a third of those 10 years ago. In meat production, therefore, pork has declined and beef increased. Swine producers have been concerned over the per capita decrease in pork consumption. Less fat and more lean meat from the consumer standpoint are considered to be the primary factors. Increasing production of meat-type hogs through breeding and feeding improvements should aid greatly in reversing the trend.

Numbers of dairy cows have continued to decline with a present total of about 23 million head as compared to a peak of nearly 28 million in 1945. Milk production, however, has risen from the 1945 peak of about 115 billion pounds to over 126 billion pounds in 1957. This means that the production per cow rose from approximately 5,000 pounds to 6,100 pounds. This is still a low figure compared to potential yields. The increase, however, reflects the effects of more rigorous culling of low-producing cows and of better breeding, feeding, management and disease control.

^{1/} Paper presented by N. R. Ellis at the Fourth Inter-American Meeting on Livestock Production held July 1958 at Kingston, Jamaica, B. W. I.

One of the effective means of bringing about improvement is the National Dairy Herd Improvement Program. Conducted at the national level through the cooperation of State associations, this program has continued to grow and expand. Actually, there are three plans within the program which individual dairymen can follow. The main one is the Standard Record Keeping Plan covering about 75 percent of the cows within the whole program in which extensive records are obtained under supervision of the Extension Service on individual cows. The second is the Owner-Sampler Record Keeping Plan and the third is the Weigh-A-Day-A-Month Plan. This is the simplest of the three plans yet a rapidly growing one especially adapted to owners of small herds and one which provides good information for selection and improvement. By January 1, 1958, there were about 2.1 million cows represented in the entire program. Production averages of the cows in the Standard Herd Improvement Associations in 1956 averaged 9,713 pounds of milk and 383 pounds of butterfat. What is most important is the fact that there has been a steady year by year increase in these average figures. Certainly the national average can be expected to materially increase in the future.

Another important aspect is the increase in financial returns. Data show that as the average milk yield per cow increases the income over feed cost also increases. Conversely, the feed cost per 100 pounds of milk produced decreases. Some recent figures place this unit feed cost at \$2.72 for a cow producing 5,000 pounds of milk, \$2.31 for 7,000 pounds, \$2.00 for 9,000 pounds and \$1.76 for 11,000 pounds.

The incentive for adoption and use of better bred animals of all classes and of better rations is generally in the increased financial returns. While there is sometimes a small increase in the investment in better bred stock or in the per pound cost of the feed, the returns in product are enough greater to more than justify the effort. In fact, the margins between costs of producing livestock and the selling price of the farmer are such that the producer must follow improved practices in order to make a reasonable profit. In the struggle of the average farmer in the United States to increase his returns and profits, this is a very important channel.

Some examples will illustrate how management has profited by adopting the newer research findings. It has been estimated that the average beef cow is now producing 539 pounds of live weight compared to 391 pounds 30 years ago. Experimental data have been reported showing an increase of about 50 percent in profits through the supplying of phosphate supplement to a beef herd on phosphorus-deficient range. The pronounced increase in calf crop plus added gains of the calves made this profit possible whether calculated on a per-cow or per-acre basis. Such examples as this last one have made possible the preceding average improvement of 148 pounds in the 30-year span.

In the case of broiler production, a comparison of prewar and present-day rations has shown that the unit feed cost has remained about the same even though new ingredients have replaced old ones in keeping with improvements in the meeting of nutritional requirements. The total feed cost per broiler has increased very little even though the average weight has increased from about 2.6 pounds to 3.4 pounds. The income over feed costs per bird

in this comparison increased from about 10 cents to 27 cents. Actually, a broiler producer today could not show a profit unless he used the improved, present-day ration.

Better management practices in swine production offer comparable examples. Some depend on breeding or type of animals, while others emphasize feeding, rearing of larger litters and still other methods. Swine production practices are undergoing a number of adjustments, some of which may have permanent effects. They are, in part, the result of research in management and in part a reflection of economic changes in farming practices. There is a trend, just as with other livestock, toward greater specialization not only in swine production as a unit operation but in phases of the operation.

Certain farmers produce and sell young feeder pigs that others grow out for market. A few years ago, the pig hatchery type of operation came into prominence in which the farmer with a herd of sows delivered young pigs shortly after birth to the purchaser who in turn reared them. Because of the hazards in handling the very young pigs away from the sow, the efforts have been toward early weaning at ages of 10 to 25 days. Special formula feeds are now marketed for starting pigs thus weaned. It is likely that sales of such pigs will increase although the great majority are still grown out on the farms where produced. Weight losses in sows through long lactation periods are reduced and they can be rebred or marketed in a shorter time than formerly.

Another growing practice closely allied with early weaning is known as multiple farrowing. In this procedure the swine farmer breeds his sows in groups to farrow throughout the year instead of short periods in the spring and fall. With the added time advantage from early weaning sows may average five litters within a two-year period. Farmers operating such programs generally keep better records on individual sows and pigs, do a better job of selecting and culling breeding stock and of managing the feeding and health protection details.

One very important development is the use of farrowing stalls whereby losses among new-born pigs are greatly reduced. It is estimated that over half of the swine producers in Iowa, the leading swine growing State, use these farrowing stalls. More attention is directed toward temperature regulation facilities not only for new-born pigs but for the older stock as well.

More pigs are grown out for market in dry lot or more confined quarters than was formerly the case. For the breeding herd there is greater emphasis on use of pastures during the summer months and on silages and other harvested forages or on the more bulky grain feeds during the winter.

Increasing numbers of farmers are turning to the selection and propagation of meat-type hogs. Various State and private testing stations provide a means for selection of breeding stock. These selection procedures have been developed through breeding research. Not only does this trend promise a better acceptance of pork on the part of the consumer, but of an increase in economy of feed use.

One change in beef production is in the management of feeder cattle. In the Western States many large feed yards have been built with facilities for mechanized operation of feed handling, including storage, grinding, mixing, and delivery into mangers of feed lots. It is estimated that over 90 percent of the cattle fattened in these Western States are handled in such yards accommodating over 100 head. Actually, the numbers usually go into thousands of head. The feeding period has been shortened in comparison with Midwestern practice. The net effect has helped to level out the marketing peaks and depressions on the year-long basis.

Another continuing development is the increasing number of beef cattle raised in the Southern States. This has been accompanied by pasture improvement for use by the beef herds.

As the spread between the cost of production and the returns from the sale of farm products decreases, the farmer is left with but two alternative choices: if he would remain in business he must increase his output at no increase in cost or he must reduce his costs. Since the United States already has a surplus of many farm products, the choice of the producer is limited to reducing costs per unit of production. Opportunity for doing this in an economy of ever increasing labor and materials costs lies primarily in greater output per man-hour spent on the job.

Studies on farms in Illinois, Massachusetts, California, Maryland, and Minnesota show that unit production may be increased with a given amount of human effort. It can be done by increased mechanization, by improved arrangement of buildings and locations around the farmstead, and by thoughtfully planned work methods or a combination of these. On some of the farms studied it was found that time for producing milk could be reduced by one-fourth to one-half by relocating equipment, by making some minor changes in building arrangement, and by adopting better work methods.

This philosophy of reducing the unit cost of production is spreading throughout the country and is resulting in an important transition in agriculture. Farms of the United States are increasing in size and reducing in number. Farmers are substituting machinery for handling materials for hired labor. Service buildings are being designed for flexibility. Feed is taken to the animals, especially beef cattle, in self unloading tractor drawn trailers and distributed in bunkers along lanes with little more effort than pushing a few buttons and driving a tractor. Dairy farms have improved their facilities for feeding and milking large numbers of cows both through the use of better-arranged stall barns and of loose housing barns. More attention has been given to ease of cleaning and feeding, to temperature control and

to water supply. These mechanical devices add to the investment in livestock enterprises but are more than compensated for by lower labor costs in larger operations if the operator is a reasonably good business manager.

Examples of labor saving arrangements and equipment are: mechanical unloading of silos, or self-feeding silos, mechanical distribution of feeds, mechanical barn cleaning, arrangement of equipment and building layouts to hold walking time and distance to a minimum, pipe line milkers (cleaned in place), and many others.

